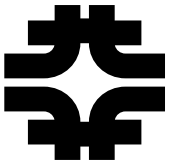

Fermilab

GP0001

NT at Fermilab

Release 2.0

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Computing Division
Fermi National Accelerator Laboratory

Compiled by Anne Heavey

ABSTRACT

NT at Fermilab is intended primarily as a resource for Windows NT 4.0 users at Fermilab who have accounts (or who wish to have accounts) on the FNAL NT domain. This guide discusses the NT environment and NT support at Fermilab, provides PC purchasing guidelines and information to help users get started using Windows NT, and includes information on software, email, file storage and printing.

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August 1998	Original Release 1.0
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Acknowledgments

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Table of Contents

1. Introduction

This chapter provides an introduction to the *NT at Fermilab* manual. In particular, it covers:

- the purpose and intended audience
- a summary of the contents of all the chapters and the appendix
- where to find the manual on-line or obtain a hardcopy
- how updates to the manual are handled
- the typeface conventions and symbols used throughout the manual
- where to send comments and questions

1.1 Who Should Read *NT at Fermilab*? Not Just NT Users...

NT at Fermilab is intended primarily as a resource for Windows NT 4.0 users at Fermilab who have accounts (or who wish to have accounts) on the FNAL NT domain. (Read Chapter 2: *The NT Environment at Fermilab* if you're not sure what an NT domain is.) Anyone authorized to use computers at Fermilab is welcome to join this domain.

One advantage of an NT domain is that users of operating systems other than NT can also access many of the resources provided on the NT servers. So if you use Macintosh, Windows 95/98, Window 3.x, or even UNIX, you may be eligible for an account on the domain, and you'll find useful information in this guide.

This guide can help you get started using Windows NT, whether you join the FNAL NT domain or not. If you're planning on buying a PC, Chapter 4: *Purchasing a New PC* provides information to help you determine what to purchase and how to go about it. Some general NT information can be found in Chapter 6: *Getting Started with NT*.

1.2 Summary of Chapters

Chapter 2: *The NT Environment at Fermilab*

In this chapter we introduce you to the environment that has been implemented at Fermilab for PCs. The PC Support (PCS) group supports and therefore is encouraging the use of the Windows NT 4.0 operating system, and we describe it here (very) briefly. We include a description of client/server networks, NT domains, and more specifically, the FNAL NT domain at the lab. You will find at the end a list of computing resources and services available on the FNAL NT domain.

Chapter 3: *NT User Support at Fermilab*

This chapter discusses NT user support. You will find information on the type of services that the PC Support (PCS) group can provide, who to call for support, and how to contact Fermilab's Customer Support.

Chapter 4: *Purchasing a New PC*

Here we discuss what you should look for when preparing to buy a new PC that will perform well in the FNAL NT domain or other modern networked environment.

Chapter 5: *Joining the FNAL NT Domain*

In this chapter we describe the things that need to be done to get an account on the FNAL NT domain. Depending on your level of support, an NT administrator may take care of some or all of these tasks for you.

Chapter 6: *Getting Started with NT*

In this chapter we provide some basic information on using Windows NT 4.0. For further information, we refer you to section 6.8 *Recommended Texts for NT*.

Chapter 7: *Software for Windows NT*

The PCS group provides a wide range of software for FNAL NT domain users. In this chapter we first discuss software licensing issues. The rest of the chapter contains information on:

- where/how to find software useful to your job functions
- purchasing software
- installing and removing software

Chapter 8: *Email*

Fermilab is promoting the use of server-based email. The Computing Division supports two Internet-oriented methods of accessing electronic mail or bulletin board messages stored on a mail server:

- IMAP (Internet Mail Access Protocol)
- POP (Post Office Protocol).

In this chapter we provide information on available mail handlers that support these protocols.

Chapter 9: *File Management in the FNAL NT Domain*

This chapter discusses file storage within the FNAL NT domain. A personal, backed-up file storage area (also called a user volume) is provided for each supported FNAL NT domain user on his or her designated server machine. Common file storage areas can also be set up for departments, groups and projects in order to facilitate file sharing.

Chapter 10: *Printing in the FNAL NT Domain*

In this chapter we include NT-specific printing information, and refer you to existing documentation. Information on printing facilities at Fermilab is maintained in a series of Computing Division Web pages. For general printing information, select *Printing* from the Computing Division Home Page.

Appendix A: *Dynamic Versus Static IP Addresses*

Here we describe dynamic and static IP addresses, and discuss the advantages and disadvantages associated with each type.

1.3 Availability of Guide

As of June 1999, this guide is available on-line at `http://www.fnal.gov/docs/pc/nt_at_fermilab/`. If you'd like a PostScript copy, you can print one from there, or pick one up in Wilson Hall (WH8NE).

1.4 Updates to Guide

We are maintaining an on-line updates page, and periodically updating the HTML version of the document from it. The PostScript version will also get updated periodically. Whichever version of the document you are using, we recommend that you consult the updates page from time to time to make sure you're getting the latest available information. The updates page is located at `http://www.fnal.gov/cd/docs/pc/nt_at_fermilab/misc/updates.html`.

1.5 Notational Conventions

The following notational conventions are used in this document:

bold	Used for product names (e.g., **Outlook Express**), Web page headings, and to emphasize text.
italic	Used to emphasize a word or concept in the text; also used for reference documents, email addresses, login ids and Web page titles and links.
`typewriter`	Used for URLs, filenames and pathnames.
<ctrl-***char***>	Indicates a control character. To enter a control character, hold down the control key (labeled Ctrl, probably) while pressing the key specified by ***char***.
sans-serif	Indicates a key to press, a Window or menu name, or a button on a Window.

The following symbols are used throughout this document to draw your attention to specific items in the text:

A "bomb"; this refers to something important you need to know in order to avoid a pitfall.

This symbol is intended to draw your attention to a useful hint.

1.6 Your Comments are Welcome!

The *NT at Fermilab* guide may contain some errors, however we endeavor to minimize the error count! We encourage all the readers of this document to report back to us:

- errors or inconsistencies that we have overlooked
- any parts of the manual that are confusing or unhelpful -- please offer *constructive* suggestions!
- other topics to include (keeping in mind the purpose of the manual)
- hints or tricks that other users might find helpful

Send your comments to *cdlibrary@fnal.gov.*

2. The NT Environment at Fermilab

In this chapter we introduce you to the environment that has been implemented at Fermilab for PCs. The PC Support (PCS) group supports and therefore is encouraging the use of the Windows NT 4.0 operating system, and we describe it here (very) briefly. We include a description of client/server networks, NT domains, and more specifically, the FNAL NT domain at the lab. You will find at the end a list of computing resources and services available on the FNAL NT domain.

Although the NT domain is intended primarily for users running Windows NT Workstation 4.0, one of its benefits is that other operating systems can access the shared resources controlled by the domain. So if you use Macintosh or Windows 95/98 (or even Windows 3.x)[1], keep reading!

> The on-line documents on the `www-dcd.fnal.gov` server will be moved in the near future to the `www-pcs.fnal.gov` server, and the URLs quoted in this chapter will no longer be valid. The new URLs have not been determined as of this writing. Try navigating to the document you need starting at `http://www-pcs.fnal.gov/`. Once the new URLs are known, they will be posted on the updates page at `http://www.fnal.gov/cd/docs/pc/nt_at_fermilab/misc/updates.html`.

2.1 What is Windows NT and How is it Used at Fermilab?

Windows NT 4.0 is one of the family of Windows operating systems from Microsoft. Its user interface is similar to that for Windows 95/98, and works in much the same way as other Windows systems you may already be familiar with. Windows NT 4.0 comes in two flavors: Windows NT Workstation (which is probably what you have on your desktop machine) and Windows NT Server (which is usually installed on "server" machines). NT was designed primarily for use in multi-server networks and domains, which we discuss in the next section.

Why choose Windows NT over Windows 95 or 98? NT is more expensive and requires more hardware than 95/98, but offers superior performance and security. For the home PC user, 95 or 98 is probably the right choice for at least three reasons: lower cost, better compatibility with older hardware and applications, and the fact that most home PC users won't need or use many of the extra features NT provides. But at the office, where you are most likely connected to a network, and you often need to run several applications at a time, NT is the better choice. NT implements multi-tasking in a more sophisticated way. The file system designed for it, NTFS, is more secure and extensible than the updated FAT system supported by 95/98 (for which a driver also comes with NT, and is used for certain tasks; e.g., accessing a floppy drive). The compatibility that NT gives up with respect to 95/98 allows it to provide a level of security appropriate to a professional networked environment, which neither 95 nor 98 can do.

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1. In principle, even UNIX-based clients can access an NT server. At Fermilab, however, UNIX support is managed separately from PC/Macintosh.

We determined that the best way to provide as many people at the lab with as many PC computing resources as possible was to implement an extensive NT network (technically called a *domain*). If you're interested, you can find in many NT texts information about its design goals and features -- reliability, performance, portability, scalability, security, and so on. We simply want to encourage the Fermilab PC users to take advantage of all the resources we've made available via our NT domain. Before listing the benefits that you get by having an account on this domain (in section 2.4 *Resources and Services Available on the FNAL NT Domain*), first you should understand what the domain is. Read on!

2.1.1 Client/Server Networks

At Fermilab, in order to access common resources (e.g., printers, the internet, and many software packages), and to send and receive email, you need to have your PC connected to a network, rather than running stand-alone. For PCs running Windows NT, several client/server networks are set up, generally by department, in which one or more *server* machines (running Windows NT Server 4.0) run programs that provide services to many connected *client* machines like yours. These programs are called *servers* (there are mail servers, print servers, file servers, and so on), and they wait for and respond to requests from clients.

Server-based networks are scalable, meaning that more server machines can be added and the resources can be reorganized as the number of client machines grows.

The NT software on your local machine is equipped to recognize local resources (those directly attached to the machine in your office) as distinct from network resources (those that must be delivered or accessed via the network), and directs your requests accordingly. In terms of using resources and working with files, you generally don't need to know if an application or document is local or remote as long as you can find it on one of the drives available to you via My Computer or Network Neighborhood or Windows NT Explorer. In practice however, you'll want to know what's on your local drive(s) and what's not, so that you know what you are responsible for managing.

2.1.2 NT Domains

Multiple client/server networks can be administered centrally by setting up an NT *domain* that encompasses them. An NT domain is really nothing more than a logical grouping of accounts (two types of accounts: user and workstation, explained below), with at least one but usually many server(s). The domain enforces a single point of administrative control, security, and authorization for multiple resources and users. NT security requires that all clients be identified and authorized on the domain to access its resources. There are two levels of authorization: the workstation and the userid. This allows an authorized user to log in from different workstations (each of which has a workstation account in the domain), and it allows different users (each with a user account) to log in from a particular authorized workstation.

You as a domain user potentially have access to resources on any server in the domain, not just the servers in your network. The individual resources maintained on the servers in the domain have permissions set (usually by each server administrator), therefore you will probably find that only some resources are available to you. You simply log into the domain (which is the usual way you log onto your PC if it's configured properly); you do not have to log into a specific server to access a resource installed on it.

Getting a little more technical, an NT domain consists of at least one server machine, the Primary Domain Controller (PDC), running the Windows NT Server operating system. The PDC stores the master copy of the domain's user and group database (called the Security Accounts Manager, SAM), and serves as the single security point. To protect against problems if the PDC goes down,

and also to alleviate its load, additional servers called Backup Domain Controllers (BDCs) can be added. The PDC periodically downloads its SAM to the BDCs, and they can process the logins to the domain.

NT domains, their communication links, and their associated policies can be grouped for the purpose of managing user and workstation accounts and domain resources. Domains are grouped according to a *domain model*. At Fermilab we have implemented what is known as a *single NT domain model*.

2.2 The NT Domain (called FNAL) at Fermilab

The name of the NT domain at Fermilab is FNAL (in upper case). Anyone authorized to use Fermilab's computers is eligible for an account on the FNAL NT domain.

The single NT domain model implemented at Fermilab was chosen for several reasons:

- It adheres to the HEPNT (High Energy Physics NT) Committee recommendations.
- It paves the way towards achieving a single userid and password for each user for all Fermilab computer systems.
- It is the easiest model to maintain.
- It implements many key features (listed below) better than do other models.

A few of the key features the FNAL NT domain incorporates are:

- A user can access the entire domain (according to his or her permissions) via a single userid and password.
- A simple organized structure makes it easy for users to find, use and control project data.
- The domain uses a secure file system and provides reliable backup facilities to protect valuable data.
- The structure facilitates consistent system management.
- The system can grow.
- The domain design can handle new versions of the NT Operating System as they become available.

See the document *FNAL NT Domain Plan* on-line at `http://www-dcd.fnal.gov/ntatfnal/domain_info/fnal_domain.html` for further information. (If this link doesn't work, look for the document starting from `http://www-pcs.fnal.gov/`.)

There are several other NT domains and workgroups at Fermilab, run by individual groups, and not under the management of the Computing Division. Depending on which group you belong to, you may be eligible for an account on one or more of the other NT domains on site. Check with your group leader or local PC administrator.

2.3 User Profiles in the FNAL NT Domain

Under Windows NT, a *user profile* is a collection of user-specific settings that define the user's working environment. These settings include such items as the wallpaper, screen resolution, and application settings (e.g., the last few files you were editing in a particular application or a list of Web sites). Profiles vary in size depending upon the complexity of the applications that take advantage of the profile area, and how much data a user saves in the profile area. The profile areas for users range from about 500K to over 25MB, with a typical size of about 5MB.

The profile can be stored locally for use on a particular machine, in which case it is called a *local* profile. Storing NT user profiles on local machines in a networked environment is only practical if the users are relatively static. Since Fermilab users often work at different locations within the lab and travel, the PCS group generally configures NT accounts to use what are called *roaming* profiles. A roaming profile is stored on the server, and is available to you as you "roam" to other NT machines, maintaining your same settings everywhere.

2.3.1 Roaming Profiles

The system downloads your roaming profile to your client machine when you log onto the NT domain, and copies it back to the server when you log off. At login, the system checks to see if your local user profile is on the machine, and if so, whether it is more recent than your server-based profile. If a local profile is not there or if it is older, the system downloads your roaming profile from the server onto that machine. If your local one is there and is more recent than your roaming profile (this happens if you shutdown the machine without logging off), the system informs you and asks you which profile you want to use. Usually you'll want to choose the more recent local profile. To reduce network traffic, the system also checks to see if the profile has changed before storing it back on the server.

An updated roaming profile does not get copied back to the server if you shut down the client machine without logging off.

There are several advantages to using a roaming profile. Most importantly, all the customization you have done with your desktop is available to you wherever you log in. This customized information is stored on a server that gets backed up regularly, so if your machine crashes, you don't need to rebuild your environment. The PCS group can also perform certain product upgrades and installs, add new shortcuts and add links to updated programs without visiting users' desktops; they just need to make changes to the stored profiles on the servers.

There are a few things to be aware of regarding roaming profiles:

- Windows 95/98 systems do not support roaming profiles.
- On a slow link, such as a dial-up line or an ISDN connected computer, it can take a long time to load a roaming profile. If you log in regularly via a slow link, you may want to have a second NT domain account created for you with the roaming profile feature disabled. Accounts for this purpose are usually set up as your username followed by *_home*, e.g., *joe_home*. Contact *pcs-group@fnal.gov* if you wish to have a home account created.
- When using roaming profiles, it is important to store wallpaper, sounds, and any other user-specific data to your 'U' disk (see section 9.1 *Storing your Files*). If files are referenced locally and the data is stored on the local machines, those files will not be found when you roam to another computer.
- A roaming profile may get confused if it gets downloaded to a system with an incompatible configuration. For example, if the roaming profile is set up to download particular software, and the software already exists on the machine, things may not work correctly. By the same token, if it expects to find software that is absent, errors can occur.
- Always remember to logoff your machine in order to save your profile back to the server.

2.3.2 Local Profiles

As mentioned in the previous section, local profiles are better when you connect via slow link, since it can take a long time to load a roaming profile. If you log in this way often, you might want a second NT domain account with only a local profile (i.e. with the roaming profile feature disabled). The PCS group typically creates these accounts as *username_home*.

The disadvantage to relying on a local profile is that it is available only on the specific machine where it resides. It cannot be made available to you when you log in from a different machine. If you use only a local profile, you should take care to back it up regularly because this information will be lost if the machine has to be rebuilt. Backup of data on local machines is the responsibility of the user.

2.4 Resources and Services Available on the FNAL NT Domain

As a member of the FNAL NT domain, you have access to lots of computing resources and services, for example:

- File storage, backup, virus-checking and disaster recovery (see Chapter 9: *File Management in the FNAL NT Domain*)
- Virus-checked software as well as PCS-supported software patches (security, OS, workstation) and updates for applications and device drivers (see Chapter 7: *Software for Windows NT*)
- Email messaging Services (See the *Email* Web page and Chapter 8: *Email* for information on the supported server-based email systems.)
- Access to a wide variety of printers at the lab through various NT servers (see the *Printing* Web page and Chapter 10: *Printing in the FNAL NT Domain* for information on printing)
- Remote Dial-up Support: Information on this topic is accessible from the Computing Division home page; select *Remote Access* under the **Network** link. The instructions and other information may be changing in the near future; check this page frequently.

To find out *how* to get a FNAL NT domain account, see Chapter 5: *Joining the FNAL NT Domain*.

3. NT User Support at Fermilab

This chapter discusses NT user support. You will find information on the type of services that the PC Support (PCS) group can provide, who to call for support, and how to contact Fermilab's Customer Support.

3.1 General PC Support Information

PC support (non-Linux) is generally provided by the Personal Computing group (PCS). The support level for any particular customer group is based on a contract (MOU, for Memorandum Of Understanding) with that group. **The PCS group can only provide services for you according to the MOU it has with your group.** Find out from your group's PC administrator what the established PC support services are for your group.

Any organizational entity (division, department, or group) at Fermilab is eligible to negotiate a level of support with the PCS group. For organizations at Fermilab that have already established internal support services, an agreement can be made in which the PCS group assists and/or backs up the support services already in place.

The menu of services that PCS can provide (i.e. services that can be included in an MOU) is listed in the on-line document *PC and Mac Support Overview* at `http://www.fnal.gov/cd/main/pcsupport.html`. This document also explicitly states what services the PCS group does *not* provide.

3.2 Who Do You Contact for Support?

Who you contact depends upon the MOU that your group has with PCS. The best place to start is your group's PC administrator or local NT server administrator. These may be the same person. If you don't know who performs these functions for your group, contact Customer Support.

Customer Support

Fermilab Customer Support (formerly known as the Help Desk) is available to answer questions related to the supported computer systems and software on site. Keep in mind that its first priority is to maintain central systems and networks, and to ensure that Fermilab-supported software is available and usable. Therefore, depending on its current workload, Customer Support may not be able to immediately attend to a request which impacts only one individual.

Customer Support can help you to identify your local server administrator, if you don't know who it is. The people there can also help you with a problem directly.

Customer Support is in service Monday through Friday, 9:00 a.m. to 5:00 p.m. You are encouraged to use email for all communications that are not urgent.

Email	During business hours and off-hours (non-urgent): *helpdesk@fnal.gov* Urgent off-hours requests only: *operator@fnal.gov*
Web Page	From the Computing Division home page (`http://www.fnal.gov/cd/`), select *Customer Support* under the heading **Services**.
Phone Number	630-840-2345 During off-hours, you can leave a phone message, or "escape" to Data Center Services (Operations) for requests requiring immediate attention.
Location	FCC 1 West

3.3 Machines Configured for NT/Linux Dual Boot

If your PC is configured for dual NT/Linux boot, support for the Linux side is provided according to current support arrangements for UNIX systems. See *Computing Division UNIX Environment Standards*, document number DR0009 available on-line at `http://www.fnal.gov/docs/Recommendations/dr0009.html`. Also see the OSS group's *Linux at Fermilab* page at `http://www-oss.fnal.gov/fss/documentation/linux/` for a variety of information on Linux.

4. Purchasing a New PC

Here we discuss what you should look for when preparing to buy a new PC that will perform well in the FNAL NT domain or other modern networked environment.

We recommend that you go through your group's PC administrator to make your PC purchase, and coordinate the necessary networking, software and installation requests through him or her.

4.1 Determining and Justifying Your Computing Needs

Some divisions require that a form detailing the need and expected use of any new desktop system be submitted before the purchase can be approved. The form is called an *Abbreviated Implementation Plan (AIP)*. The Fermilab standard AIP format is available on-line at `http://www.fnal.gov/cd/forms/aip_format.html`. Your group's PC administrator will know if you need to submit it. Even if your department/division does not require this, you may want to look it over. It can help guide you in outlining your needs and thinking about system security.

4.2 What to Buy

4.2.1 Standard PC Running Microsoft Windows Software

What you need in a PC depends upon the functions you will need to perform (the following recommendations were determined as of May 1999; we will attempt to keep them updated as newer technology becomes available):

Physics Analysis and Engineering Use:

A very fast Pentium III (minimum 500 MHz) with standard integrated 3COM 10/100 ethernet card and a high-end graphics card.

If you plan to run Linux as well, see section 4.2.3 *Windows/Linux Dual Boot System*.

General Use:

A Pentium II, not quite as fast as that needed for physics analysis (we recommend 400 MHz) with standard integrated 3COM 10/100 Ethernet Card. (See note above regarding Linux.)

The following workstation configuration should be suitable for most users at Fermilab. Most of the popular hardware vendors can provide these features:

- Intel Pentium II or III
- 400 MHz or greater CPU with 256 kB or greater cache
- 3 or 4 PCI slots and 3 or 4 ISA slots

- minimum of 128 MB SDRAM memory
- 1.44 MB diskette drive
- ~ 3 GB EIDE hard drive or SCSI hard drive
- high speed CD-ROM/DVD drive
- PCI SVGA card with 4 MB memory with 1280x1024 True color (16.7 million)
- 104 Key enhanced keyboard
- mouse
- Intel or 3COM 10/100Base-T Ethernet
- Microsoft Windows NT Workstation 4.0 (or current release) installed
- option for 21-inch monitor or 17-inch monitor

All components must be on Microsoft's *Hardware Compatibility List* (available on-line at `http://www.microsoft.com/hwtest/hcl/`). You should ensure that your vendor can provide adequate technical support and service for at least the first year.

If you are purchasing peripherals for a Windows NT system you already have, you should also check the NT-compatibility list to see that the exact model of the peripheral is supported by the exact version of NT you are running.

Also ask your group's PC administrator about any additional requirements, including software that should be included in the order.

4.2.2 Windows Laptop System

We have identified a number of things to consider when ordering a laptop. They are listed in the Web page **Laptop Support at Fermilab**, at `http://www.fnal.gov/cd/main/laptop.html`.

4.2.3 Windows/Linux Dual Boot System

The hardware requirements are slightly different for a workstation that is intended for Windows NT/Linux dual boot. In particular, the 3COM ethernet card mentioned above is not recommended; Linux will run at 10 but not at 100. We recommend the Intel EtherExpress card instead. For more information, refer to the OSS group's Web page on Linux at `http://www-oss.fnal.gov/fss/documentation/linux/`.

4.3 Warranties

All new computers come with either a standard 1-year or 3-year *Next Business Day On-Site Service* warranty. **Please do not install or remove any hardware on your computer within the warranty period as this would break the warranty!**

4.4 Repairs

For repairs, notify your group's PC administrator and inform him or her whether your system is still under warranty.

4.5 When You're Ready to Purchase ...

Please contact your group's PC administrator to find out how the purchase should be transacted; the procedure varies from group to group and department to department.

4.6 Configuring your New PC

Contact your group's PC administrator or your local NT server administrator. Depending on your group's support level, you may be able to have a support person completely configure your PC for you. See Chapter 2: *The NT Environment at Fermilab* to learn about the Windows NT environment provided at Fermilab, and Chapter 3: *NT User Support at Fermilab* to find out who to contact.

5. Joining the FNAL NT Domain

In this chapter we describe the things that need to be done to get an account on the FNAL NT domain. Depending on your level of support, an NT administrator may take care of some or all of these tasks for you.

5.1 The Whole Story in a Nutshell

If you have a previously-used PC that must be reconfigured in order to join the FNAL NT domain, you'll need to contact the PCS group at *pcs-group@fnal*. Your "Whole Story" will depend on your initial configuration. Now, for the typical case:

You've just gotten a new PC. If you followed the purchasing recommendations, it already has Windows NT 4.0 Workstation installed on it. Now you've got to get it configured to work in the Fermilab network so that you can send and receive email, access the internet, print to networked printers, and so on. This involves getting an ethernet connection and an IP address. Beyond that, you've also decided to join the FNAL NT domain so that you can access the resources it provides and store your important documents in an area that gets backed up regularly. How do you get from here to there?

If you belong to a department or group that is fully supported by the PCS group, you may find that your PC gets ordered, delivered, and configured without any actions on your part. You probably will need to provide some information to your local server administrator or to your group's PC administrator, such as your preferred userid and necessary software, but all the work will be done for you.

Fully-supported users don't need to read any further in this chapter.

For those of you with a less-than-comprehensive support agreement, contact your group's PC administrator to find out what procedure you should follow. You should decide whether you want a file storage area on a server, or if you only need to access NT domain resources. Here's a summary of the information you may need to gather and the steps that you may need to take:

- Choose a name for your computer (called a NetBIOS name[1]) to identify it uniquely within the network and domain. Recommended naming conventions: start with a letter, end with a letter or digit, have as interior characters only letters, digits and hyphens; do not use slashes, underscores or other special characters. NT 4 imposes a 15 character limit.
- Along with the NetBIOS name, be prepared to provide a descriptive comment to allow support personnel to identify the machine's location and primary user. Include the following information: your name, location, phone extension, and email address.

1. In NT 5, this will change. NT 5 will no longer use NetBIOS, it will instead use DNS (Domain Name System) hostnames, which are essentially readable IP addresses (e.g., *your_subdomain.fnal.gov*). In anticipation of NT 5, please choose your NetBIOS name according to our recommendations. Then when we upgrade, NT 5 will use your established NetBIOS name as the *your_subdomain* part of the DNS name.

- Choose the kind of IP address you want (static IP or DHCP; see section 5.2 *Do You Want a Static or Dynamic IP Address?*). Most people should use DHCP.
- If you need to install Windows NT, incorporate the NetBIOS name and type of IP address into the configuration; if NT is already installed, change the setup to include this information.
- Submit the *Node Registration Form* on-line at `http://fncdug.fnal.gov/misnet-cgi/nwsvc.pl` to register your machine on the network and to get a static IP address if that is what you want (this form requires the information mentioned above).
- To join the FNAL NT domain, you'll need both a domain workstation account (to authorize your workstation to the domain) and a domain user account (to authorize access via your userid). If you have ever accessed the FNAL NT domain from a different machine, you probably already have an NT user account. To get a workstation account, send email requesting one to *pcs-group@fnal.gov* or to *helpdesk@fnal.gov.* Include in the email your name, phone extension and the machine (NetBIOS) name. To get a user account, submit the *Request for NT Account* form (see section 5.3 *The Request for NT Account Form*).

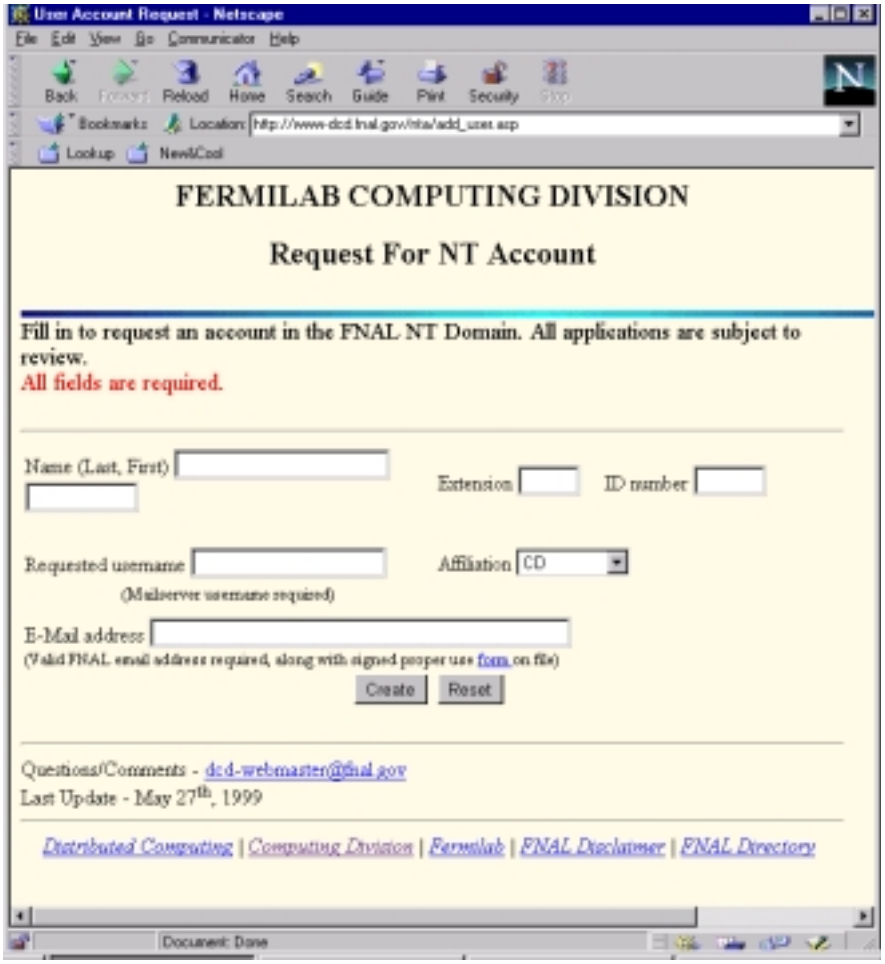
5.2 Do You Want a Static or Dynamic IP Address?

An IP (Internet Protocol) address uniquely distinguishes your node from any other on the internet. Before submitting the *Node Registration Form*, you need to know what type of IP address you want. The address can be either dynamic or static; the differences and the pros and cons of each type are discussed in Appendix A: *Dynamic Versus Static IP Addresses*. Dynamic IP addresses are known as DHCP addresses (for Dynamic Host Configuration Protocol). You may want to check with your group's PC administrator to see what is recommended for your group or for your machine in particular. Generally, DHCP addresses are used. This is at least partly because NT networking has been built around the use of DHCP for workstations, and DHCP provides reliable and simple TCP/IP network connections.

You may want a static IP address, however, if you need to run a Web server or an **ftp** server on your machine. Your clients will need a stable address for accessing your server.

5.3 The Request for NT Account Form

The *Request for NT Account* form is used to request a user account on the FNAL NT domain. It is only one page long, and looks like this:



After you fill in the information and press Create, a page will come up which confirms the information you entered, and tells you that you'll receive notification when your account has been created.

Before you receive this notification, a folder with your name or logon id will appear in the `Users` area of the server to which you get assigned. The PCS group will be creating a `pcapps` folder in your personal folder on the server. If you have been using the **Eudora** mail handler, a `mail_enc` folder will also get created.

5.4 Join the nt-user Mailing List

We have established a self-subscribing mailing list for providing information to NT domain users, *nt-user@fnal.gov*. Subscribers are sent email about newly available freeware, product upgrades, OS upgrades, patches, licensing issues, and general information about NT. We encourage you to subscribe! To do so, send email to *mailserv@fnal.gov* with no subject line, and the message content:

`subscribe nt-user` *your_userid*`@fnal.gov`

Do not include any other text in the message body.

6. Getting Started with NT

In this chapter we provide some basic information on using Windows NT 4.0. For further information, we refer you to section 6.8 *Recommended Texts for NT*.

Except where stated otherwise, when we say “click on” an item, you’re supposed to use the left-most button on your mouse.

6.1 Logging In

Under Windows NT 4.0, you need to log in to your machine whether the machine is part of a network or domain, or even running stand-alone. When starting up NT, first do Ctrl + Alt + Del as prompted, then fill in the login box that appears.

You need to provide three (correlated) pieces of information:

- a username
- a password
- either a domain name (for logging into a domain, the usual case) or the machine name (for logging into the local or other networked machine); a pop-up list is provided

We recommend that you use the same username for all your Fermilab accounts, but different passwords for security reasons. However, if your username (and password) is different for the different systems you may be logging into, just be careful to use the one(s) associated with the selected domain or machine.

Your machine will probably display your username and a domain (FNAL in most cases), therefore all you normally need to enter is your domain password. The values displayed are determined by the most recent login, so if anyone else ever logs on to your machine, the wrong username and domain may be displayed.

Once your login information is correctly entered, press Return or click OK to execute the login process.

6.2 Logging Off

First, an important note about logging off: If your account uses a roaming profile (discussed in section 2.3 *User Profiles in the FNAL NT Domain*), you must remember to log off your machine at the end of your session in order to ensure that the updated profile gets copied back to the server.

To log out and leave the machine running, enter Ctrl + Alt + Del and select Logoff. Another way to do this is to select Shutdown from the Start menu (see section 6.4 *The Start Button*), and choose “Close all programs and log on as a different user”. Both these methods leave your machine at the prompt “Press Ctrl + Alt + Delete to log on”.

See section 6.6 *Booting, Rebooting, and Shutting Down* for information on shutting down your machine (recommended before turning power off).

6.3 Changing Your Password

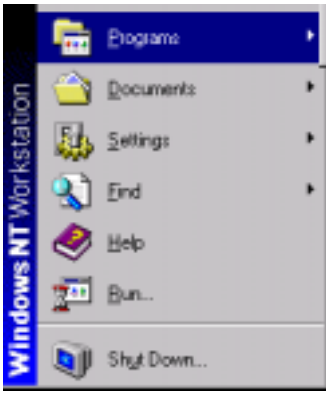
For members of the FNAL NT domain, you are given an initial password and requested to change it the first time you log on to the domain. From the main Windows NT screen, press Ctrl + Alt + Delete to bring up the Windows NT Security dialog box. Select Change Password... to bring up the Change Password dialog box.

Choose from the pop-up list or type in the domain (or system) for which you want to change your password. The one where you are currently logged on is displayed. You must first enter your old password, then the new password must be entered twice, for confirmation. Click OK to complete the change.

> Tips on choosing a password:
>
> A password can contain up to 14 characters (but note that passwords longer than 8 characters can cause problems with some FTP client programs). Passwords are case-sensitive, and can include upper and lower case letters as well as numbers and symbols. Alt-modified characters and function keys are not allowed.

6.4 The Start Button

From the main Windows NT screen, click on the Start button. It appears on the taskbar, which is a bar displaying all the tasks that are currently open (this is explained in section 6.7.1 *Running and Controlling Programs*). Your taskbar is probably at the bottom of your screen, although it can be configured to appear along any of the four screen edges. When you click on Start, a menu similar to that shown below pops up with options to let you start programs, list documents you've opened recently, change settings of system components, search for files, get help, or log out/shut down. For any item that has a little black arrow to the right, just hold the cursor over it and a menu of items for that option appears. Move your cursor along, following arrows from menu to menu as they pop up, and finally click on the item you wish to select.



You can customize your Start menu to include other items. It is useful to include *shortcuts* to frequently accessed programs, folders or documents. Shortcuts are discussed in section 6.7.6 *Creating Shortcuts*.

6.5 Temporarily Locking Your Workstation

Locking your workstation keeps your work both unseen and untouched by others while you are away from your desk. To lock your workstation, first enter Ctrl + Alt + Del. Your screen clears and a pop-up window appears with several options. Select Lock Workstation. A second pop-up window appears and indicates that the workstation is in use and is locked. It instructs you to enter Ctrl + Alt + Del to resume work. You will need to provide your password.

6.6 Booting, Rebooting, and Shutting Down

To boot your machine initially, simply turn it on.

To reboot while logged on, click the Start button, choose Shutdown..., select Restart the computer? and respond Yes.

If you just want to shutdown your machine, click the Start button, choose Shutdown..., select Shut down the computer? and respond Yes. We recommend doing this before turning the power off. It prompts you to save any unsaved changes, and it makes sure data in memory is saved to disk. Normally you should shutdown and power off your machine before any planned power outages.

If your machine is frozen, use Ctrl+Alt+Del to bring up the NT Security window. Choose Shutdown. From there you can select either plain Shutdown or Shutdown and Restart.

6.7 Basic NT Operations

6.7.1 Running and Controlling Programs

Starting a Program

There are a few ways to start programs. The easiest way is to:

1) Click the Start button

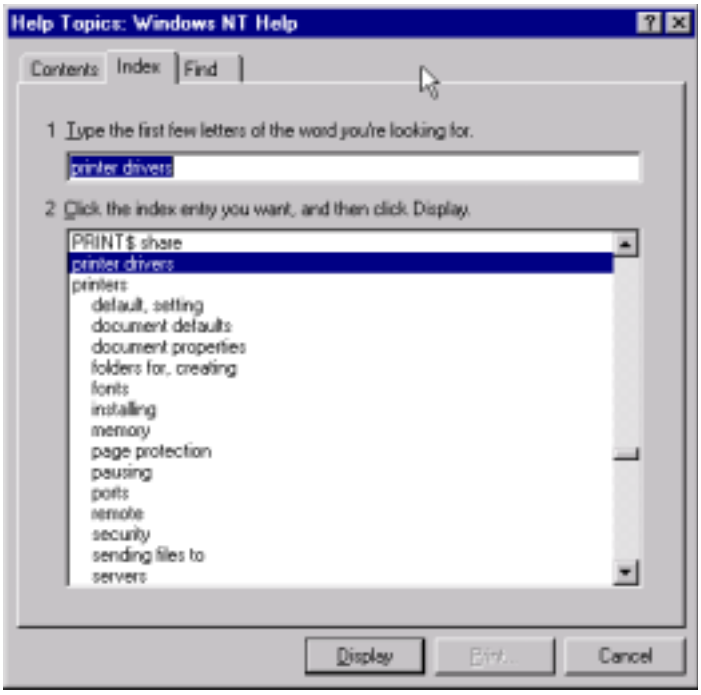
2) Point to Programs

3) Point to the program you want

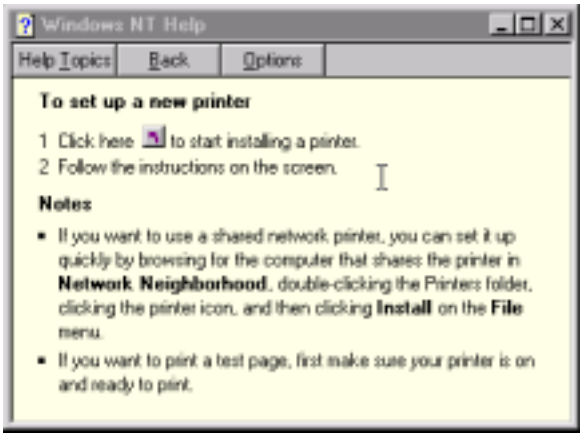
4) Click on it to start the program

Other ways include (but are not limited to):

- Search for a program executable in **Windows NT Explorer** (discussed in section 6.7.2 *Viewing the Resources of your Computer and Domain*), and double-click on it there to start it.
- Click the Start button, point to Run, and enter the name or path of the program you want to run (to see where things are on your computer, again see section 6.7.2). The Run pop-up window also lets you browse for the item you want.
- When you really don't know where to look for a particular program, click the Start button, point to Help, go to Index, ...



... type or select a topic, and select Display, as shown above. The Help screen that appears may have a button you can click on to start the program, as shown below.



Controlling a Program

A standard NT window that displays a folder's contents or in which a program is running has three buttons in the upper right-hand corner, as shown below:

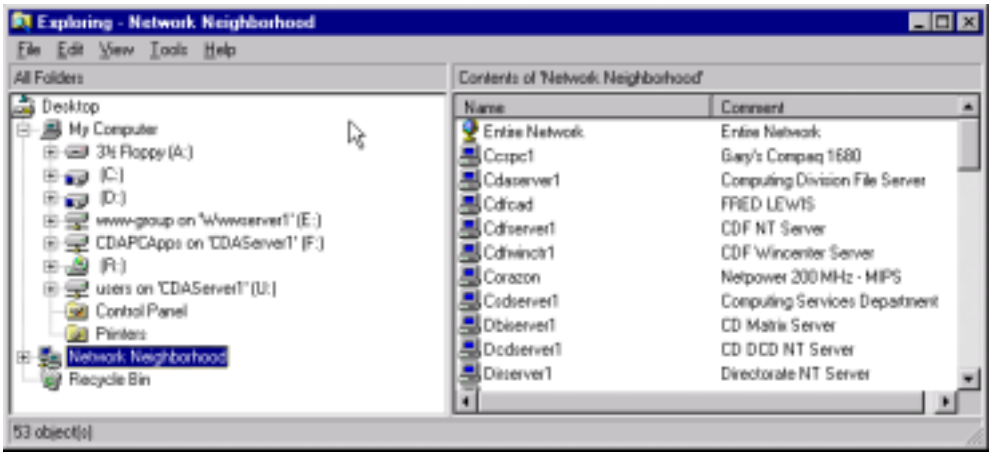
- a little horizontal line (an underscore) for iconizing
- a single square for increasing window size to occupy whole screen, or a double square for restoring window to a size you had set
- an X for exiting the program

You can run multiple programs at a time. The taskbar located along the bottom (or other edge) of your screen displays a button for each open task, or program, so that you can switch between them easily. To iconize a program window, click on its iconize button (_). To restore an iconized application window, or to bring to the front one that is hidden by other windows, click on its corresponding button on the taskbar. To exit a program, click on its X button.

If a program stops responding, right click in an empty portion of the taskbar and select Task Manager... from the pop-up menu (or press Ctrl+Alt+Del to bring up the NT Security box, and click on the Task Manager button) to bring up a window that shows which programs are running and which if any are “Not Responding”. You can use the End Task button to terminate an unresponsive task. This should unfreeze your computer.

6.7.2 Viewing the Resources of your Computer and Domain

To view all the disks, servers, folders and files available to you, run **Windows NT Explorer** (under Programs from the Start menu).

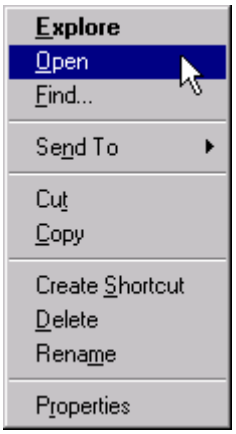


- Click on the plus sign to the left of an item in the left-hand window to expand its contents below it (individual files are not displayed).
- Click on the minus sign (that replaces the plus) to “close up” the contents list.
- Click on the item itself in the left-hand window to expand its contents (including files) in the right-hand window.
- You can double-click on an executable in the right-hand window to start it up (if the program appears in your Program menu, it’s usually easier to execute it from there). Double-clicking on a document file starts up its corresponding application with the document file opened.

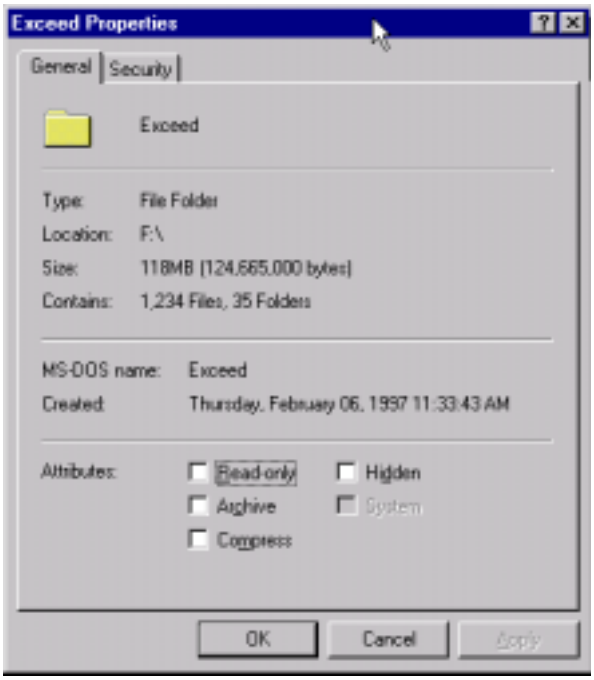
You will very likely also find **My Computer** and **Network Neighborhood** as icons on your screen, but you can get at everything from one place via the **Explorer**.

6.7.3 Identifying and Manipulating Objects and their Properties

Every object you use in Windows NT (e.g., files, folders, programs, shortcuts, the taskbar) comes equipped with what is called a *context menu.* Right click on any object, and its context menu appears. The menu contents, which vary according to the object type, allow you to do things such as find out information about the object, open or start it, edit it, create a shortcut to it, delete it, and so on. For example, right clicking on the **Exceed** program folder brings up the menu shown here:



A particularly useful menu item which appears on virtually every context menu is Properties. Clicking on Properties brings up a dialog box which allows you to see and in many cases configure the properties of the object. For this example, the Properties dialog box looks like this:



Rather than going into detail here about context menus and properties, we recommend that you spend a few minutes looking at the context menus for objects of various types to get an idea about the menu options that go with them, and the different properties that you can view and manipulate.

6.7.4 Copying and Moving Information

There are a few different ways to move and copy files and folders from one location to another.

Using the Left Mouse Button to "Drag and Drop"

When you use the left mouse button, you have to be aware whether you're moving/copying from one place to another on the same disk, or to a different disk. The following action *moves* the item when going between folders on the same disk, but *copies* the item when going between folders on different disks. Note that you can use the Escape key to abort a move or copy operation.

1) Move cursor to item.

2) Hold down left mouse button and "drag" item to destination folder.

3) Let go of the mouse button to "drop" item in.

Using the Right Mouse Button

To move or copy a file or folder from one place to another (on the same or a different disk):

1) Place the cursor on the item you want.

2) Press down the right mouse button.

3) While holding the right mouse button down, drag the item to its destination folder.

4) With cursor at destination, let go of the mouse button. This brings up a menu from which you can choose Move Here or Copy Here.

Here is an alternate method for moving or copying an item to another place on same or different disk:

1) Click item using right mouse button to bring up context menu.

2) Choose Cut (to move) or Copy.

3) Right click on destination folder.

4) Choose Paste from menu.

Using the Edit Menu in Windows NT Explorer

To move or copy a file or folder from one place to another (on the same or a different disk):

1) Select the item you want.

2) Select Cut (to move) or Copy from the Edit menu.

3) Select the destination folder.

4) Select Paste from the Edit menu.

Copying a File to the Same Folder

To make a copy of a file within the same folder, click on item to select it, then press <Ctrl-c> <Ctrl-v>. It will have the file name `Copy of filename`. To give it a new name, select Rename under the File menu (or do two slow clicks on the filename, not a double-click!), then type in a new name.

6.7.5 Manipulating Multiple Files/Folders

To select and operate on multiple files, first arrange the files in a convenient manner using Arrange Icons under the View menu. Select the first file you want in the usual way. Then:

- To select a group of adjacent files, press Shift and at the same time click on the last one you want (if you have icons displayed in a grid, you can select vertically and/or horizontally).
- To select a group of nonadjacent files, hold down Ctrl, and click on the desired files individually.

To operate on the set of selected files, continue to hold down Shift or Ctrl, and perform the operation normally (e.g., right-click to bring up a context menu).

6.7.6 Creating Shortcuts

A shortcut is a reference, or a pointer, to a program, file or folder. Shortcuts allow you to open programs and documents from easy-to-get-to places, while keeping the actual files elsewhere. A shortcut icon is distinguishable by a tiny arrow in its lower left corner. You click on a shortcut icon the same way you would any other icon. Shortcuts can go in your Start menu, the Programs folder, any other folder, or on the desktop.

To create a shortcut:

1) Click the icon of the actual item, and choose Create Shortcut from the File menu. Or, just right click on the icon to bring up the context menu and choose Create Shortcut.

2) A new icon appears, titled `Shortcut to item-name`, with the little arrow in the lower left corner.

3) Move the shortcut icon to the desired location as described in section 6.7.4 *Copying and Moving Information*.

6.8 Recommended Texts for NT

- The Microsoft Windows NT Workstation guide *Start Here (Basics and Installation)*, which is distributed with new NT systems, describes the standard NT features quite well.
- *Dummies 101: Windows NT* by Andy Rathbone starts with the basic NT operations and works through customizing your desktop and installing programs.
- *Windows NT 4 Workstation Desktop Companion* by Richard Mansfield and Charles Brannon is a good comprehensive reference.
- *Complete Guide to Windows NT 4 Workstation* by Peter Norton and John Paul Mueller is good for the reader who wants more meat. It doesn't spend a lot of time on the basics, but you will most likely find in here anything you might ever want to know about NT 4.0, written in clear English. It also provides a "Windows NT Workstation at a Glance" pull-out reference sheet with lots of handy tips.
- To understand more about networking with NT, *Windows NT Networking for Dummies* by Tittel, Madden and Follis is helpful.

7. Software for Windows NT

The PCS group provides a wide range of software for FNAL NT domain users. In this chapter we first discuss software licensing issues. The rest of the chapter contains information on:

- where/how to find software useful to your job functions
- purchasing software
- installing and removing software

7.1 Software Licensing

Whether or not you need a license to use a software product depends upon how the software is distributed. The distribution categories include: commercial, shareware, freeware, and public domain. We describe them briefly in section 7.1.2 *Software Distribution Categories*. First, in section 7.1.1 *License Types*, we discuss the license types.

We (the PCS group) act as software distributor to the groups we support. We maintain a database of the licensed software used by members of our supported groups for the purposes of managing upgrades, coordinating bulk purchases to get favorable pricing, and managing licenses.

We have implemented a program whereby all the licensed software we control is "keyed" according to its use restrictions. We install the client portion of this program, **KeyAccess**, on the workstations in the domain. **KeyAccess** intercepts all events initiated from the workstation relating to keyed programs, ensuring that only authorized access occurs. When you're accessing a keyed program, you can see the KeyAccess icon on your taskbar.

7.1.1 License Types

The software that the Computing Division provides for NT users is all legally licensed according to one of the following license types:

- Site license: licensed to the entire Fermilab site and can be used by any Fermilab user
- Unspecified multi-user license: licensed for use by a maximum number of concurrent users; any Fermilab user can run it as long as there is a copy available
- Specified multi-user license: licensed for use by a specified number of identified users (concurrently or not); no one else can run it
- Individual license: licensed for use by a particular identified workstation

7.1.2 Software Distribution Categories

Commercial

Commercial software represents the majority of software purchased from software publishers. It is virtually always copyrighted, and the licensing restrictions vary somewhat vendor to vendor and product to product. It is generally more expensive than competing shareware products. Often evaluation copies are available, but they usually have a built-in "time-bomb" wherein after a certain number of days the product will no longer work unless you key in a valid license number.

Shareware

Shareware is marketed by freely distributing a limited or fully functional version of the product, usually via the Web, for evaluation by potential users. Like commercial software, shareware products are generally copyrighted and must be purchased for continued use. The licensing of shareware usually operates more by the honor system than by embedded time-bombs, but is still legally required. The licensing restrictions are usually a little looser than those for commercial products in the area of redistribution, but they vary from product to product.

Freeware

Freeware is distributed freely without a license fee (notice we didn't say "without a license"), usually via the Web. Like commercial software and shareware, freeware products are generally copyrighted. Thus restrictions on use and redistribution may apply, and they vary from product to product.

Public Domain

A software product becomes public domain when the copyright holder relinquishes the rights to it. Software in this category has no fee and no licensing restrictions associated with it.

7.2 What Software is Available and Where Can You Find It?

For a list of some of the more widely used products at Fermilab and their availability, see our Web page *Software Products for Windows NT* at `http://www.fnal.gov/cd/main/pcsoftware.html`.

Products provided on the FNAL NT domain are maintained in a few different locations, depending on their licensing category and function. Some of these products need to be downloaded and installed into your area before using, others are ready for use in the location where you find them. Contact your server administrator if you have any questions or if you need a product downloaded and installed.

- The Pckits server (select `Pckits` under your Network Neighborhood) is maintained by the PCS group, and it stores software in the `Desktop Tools` folder that can legally be made available to all authorized users of the domain, namely freeware and some site-licensed applications. There is a wide functional range of applications represented in `Pckits/Desktop Tools`.
- Departmental servers are each maintained by a PCS group representative, and generally have an area set aside in which applications are stored (e.g., `CDAPCApps` on cdaserver1). These applications may include freeware, shareware and/or commercial products (generally licensed for multiple users), and often are specific to the types of functions people in that department perform. Access to a given product by authorized users of the server is restricted according to the product's licensing agreement.

- Individually-licensed products supported/maintained by the support staff are generally stored in the `pcapps` folder of the licensee's user volume on his/her designated server (see section 9.1 *Storing your Files*).

7.3 Purchasing Software Products

You may occasionally find that none of the provided software meets a particular need, in which case you'll have to obtain a product that does. You may be satisfied with one of the freeware or public domain offerings, or you may need to purchase a shareware or commercial product. Once you've determined which product you need (and have received approval for purchasing it), we strongly recommend that you submit your request through your local server administrator. He or she can verify that the software you're ordering is compatible with your environment, that the application runs on NT, and often tell you whether it will install on the server or if you need to install it on your local disk. The server administrator can also either order the product for you or provide guidance on the procedure you should follow.

7.4 Installing Software Products

We recommend that in general you install any products you obtain independently into a programs folder that you create in your own user area on your designated server (e.g., `U:\myprograms`). Don't install products into the `pcapps` folder in your area; that is for applications that the support personnel maintains for you. We recommend installing on the server rather than on your local hard drive whenever possible for reasons stated in section 9.1 *Storing your Files* (namely, for backups, maintaining a "clean" machine and virus-checking). Some applications will only install on your workstation's hard drive, in which case you have no choice. Be extra careful about keeping the original media in this case!

Software that is installed on an NT client for use by multiple users on that specific machine only should have the shortcuts placed in the 'All users' profile area (typically configured to be under `C:\\Winnt\Profiles\All Users\Start Menu\Programs`). This area is seen by all users when they log into the machine. Some applications may have trouble with this, in which case other users will have to find the software without the benefit of shortcuts, or they can create their own.

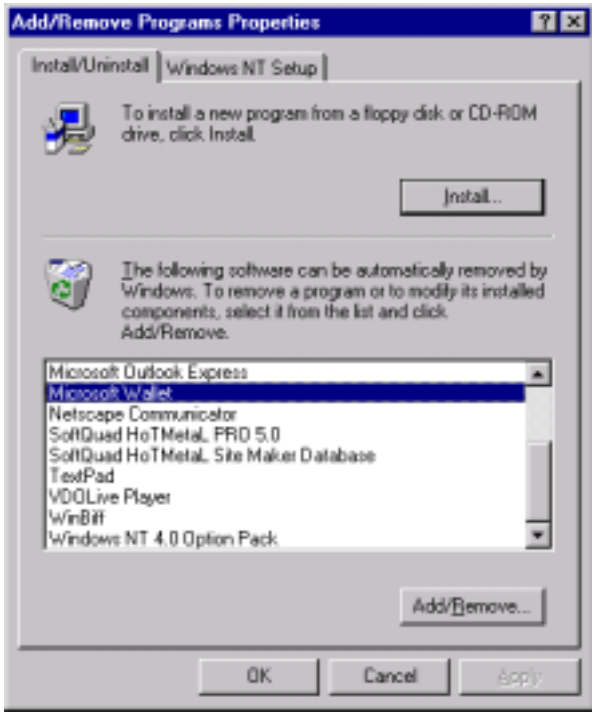
Many supported users do not have the authorization (or the inclination!) to install products, and they need to contact their local server administrator to perform the install. For those users who *do* have authorization and who prefer to install the software themselves, we still recommend that you contact your server administrator to find out if there are any particular guidelines you should follow.

7.5 Removing Software Products

Whenever a program is installed, entries get made in the registry. The registry is the database used by Windows NT (and by Windows 95/98) to keep track of settings for all the installed programs, as well as for the OS settings. (Windows 3.1 used `.ini` files for this purpose.) When you're ready to uninstall a product, you want to make sure that all of its "tentacles" get removed from the registry properly in order to keep the registry, and thus the system, working properly and efficiently. Using the NT *Add/Remove Programs* feature is your best bet for accomplishing this.

We strongly discourage you from attempting to edit the registry directly; a single bad edit may cause the operating system to fail or to be unable to boot, sometimes requiring reinstallation of NT.

The NT *Add/Remove Programs* feature is found on the Control Panel (select Start, Settings, Control Panel, Add/Remove Programs), and shown below. Select *Install/Uninstall*, as shown, choose the product you want to remove, and click on Add/Remove. As a safety feature, a pop-up screen asks you to confirm that you want to remove this product before the system goes ahead.



If you have trouble removing a product, or you observe incorrect behavior on your system after removing a product, contact *pcs-group@fnal.gov* for assistance.

8. Email

Fermilab is promoting the use of server-based email. The Computing Division supports two Internet-oriented methods of accessing electronic mail or bulletin board messages stored on a mail server:

- IMAP (Internet Mail Access Protocol)
- POP (Post Office Protocol).

In this chapter we provide information on available mail handlers that support these protocols.

For more information on IMAP and POP, and to find out how to get an account of one type or the other, see the Computing Division's *Email* Web page and navigate to *Mail Server Protocols: IMAP and POP*. For information on obtaining the recommended mail handlers and other products, see the Web page *Software Products for Windows NT* at `http://www.fnal.gov/cd/main/pcsoftware.html`.

If you choose POP, we recommend that you store your downloaded messages on your departmental server rather than on your local drive.

> The on-line documents on the `www-dcd.fnal.gov` server will be moved in the near future to the `www-pcs.fnal.gov` server, and the URLs quoted in this chapter will no longer be valid. The new URLs have not been determined as of this writing. Try navigating to the document you need starting at `http://www-pcs.fnal.gov/`. Once the new URLs are known, they will be posted on the updates page at `http://www.fnal.gov/cd/docs/pc/nt_at_fermilab/misc/updates.html`.

8.1 IMAP Clients

The supported IMAP clients on NT are **Netscape Communicator** and **Outlook Express**.

- **Netscape Communicator 4.5** (See: *Configuring and Using Netscape 4.x as a IMAP client* at `http://www-dcd.fnal.gov/imap/win/ns/`)

  A few of its desirable features are:

  - *disconnected* mode of accessing remote mailboxes (wherein the mail client connects to the mail server, makes a cache copy of selected messages, and then disconnects from the server; later client reconnects and resynchronizes with the server)
  - filtering of incoming mail into different folders
  - notification of new mail

- **Outlook Express 4.x or 5.x** (See: *Configuring and using Outlook Express on Windows 95 / NT as an IMAP client* at `http://www-dcd.fnal.gov/imap/win/oe/`)

  It supports simultaneous connection of multiple servers/accounts, but its limitations are:

  - no server-to-server file/folder copying
  - no filtering (messages not sorted and dropped in particular folders or deleted) in IMAP mode
  - no new mail notification in IMAP mode for **OE 4.x** (**OE 5** does support it)

  A product called **WinBiff** is available for new mail notification, and can be used in conjunction with **Outlook Express** and other mail readers.

You can also get to these configuration documents via the *Windows IMAP Client configuration* Web page, `http://www-dcd.fnal.gov/imap/win/`.

8.2 POP Clients

The two mail handlers supported for IMAP on NT (**Netscape Communicator** and **Outlook Express**) also can be used as POP clients. A few notes:

- **Netscape Communicator** cannot run in disconnected mode using POP (disconnected mode is meaningless in POP).
- **Outlook Express** supports new mail notification and filtering when used in POP mode.

Additional supported POP clients are **Eudora**[1] and **Pegasus**. They both support new mail notification and filtering, and are considered good mail handlers.

- For information on configuring **Eudora**, see the document *Eudora Light for Windows (WfW, 95, NT)* at `http://www-dcd.fnal.gov/dcd/mail/pc-eudora/`.
- To configure **Pegasus**, see *Pegasus for Windows (Windows 95 and Windows NT)* at `http://www-dcd.fnal.gov/dcd/mail/pc-pegasus/`.

The product **WinBiff** is available for new mail notification, and can be used in conjunction with any of these mail readers.

1. There are two versions of **Eudora**, **Eudora Pro** and **Eudora Light**. **Eudora Pro** supports filtering; **Eudora Light** does not.

9. File Management in the FNAL NT Domain

This chapter discusses file storage within the FNAL NT domain. A personal, backed-up file storage area (also called a user volume) is provided for each supported FNAL NT domain user on his or her designated server machine. Common file storage areas can also be set up for departments, groups and projects in order to facilitate file sharing.

There are no restrictions on the use of these areas other than general lab restrictions; see *Policies and Rules to Protect Fermilab Computers* on-line at `http://www.fnal.gov/cd/main/proper.html`. The size of each area varies depending on the availability of space on the server.

Note: At present, file storage areas are only offered to members of departments that are supported by PCS. Most of the supported departments have one or more dedicated servers. If you are not sure whether your department has a server, contact your local administrator or send email to *pcs-group@fnal.gov.* There is no general-purpose server at this time, but we are planning to make one available in the near future.

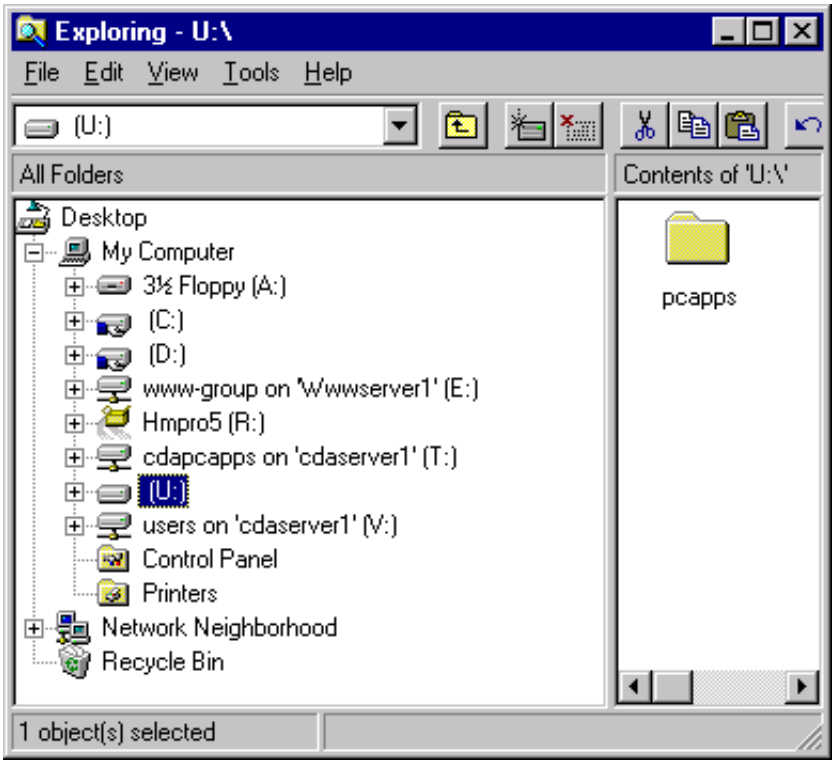
9.1 Storing your Files

The PCS group recommends that you store all your important files in your personal area on your designated server, *not* on your local hard disk. This includes both document files and applications (when possible; not all applications will install on a server). There are a few reasons for this recommendation:

- Backups are done automatically for you, so you never need to remember to backup your files.
- In case of a severe problem on your PC, the support person may need to wipe your machine clean and start fresh; any files you maintain locally would be lost in this event.
- We run virus-checking on all the files stored on the servers.

For each application, check the default location for saving files. Most of the PCS-supported software is configured to save files to your user volume on your server. Many other applications default to your local hard disk, and you may want to change these locations to your server volume.

Pull up the **Windows NT Explorer** (click on the **Start** button, and look under **Programs**). Assuming your machine was configured according to the PCS group's convention, you should see a server symbol for drive `U:` which is your user volume on the server. Double click on your folder to open it; on the right-hand side of **NT Explorer** you should now find a folder called `pcapps`.



9.2 Backing Up and Restoring your Files

Assuming you follow the recommendation of maintaining all your files on the server, you should never need to worry about backing up your files.

All supported servers are backed up nightly. Incremental backups are run every 24 hours, and a full backup is run once per week. Contact your group's PC administrator, Customer Support (see section 3.2 *Who Do You Contact for Support?*), or your local server administrator to request file restores. The waiting period on file restore requests depends on urgency; under normal circumstances the average waiting time is about two hours, and 24 hours can be taken as an upper limit.

Individual workstations are not included in these backups. You are responsible for backing up any files stored on the hard drive(s) local to your machine. We do not provide backup media or software for this purpose.

9.3 Virus Protection

If you choose to maintain any software and/or data on your local machine, you may want to acquire anti-virus software. Here are some places to look for information:

Yahoo!

```
http://dir.yahoo.com/Computers_and_Internet/Security_and_Encryption/Viruses/
```

CIAC's Virus database

`http://ciac.llnl.gov/ciac/CIACVirusDatabase.html`

The Federal Computer Incident Response Capability

`http://www.fedcirc.gov/`

Virus Descriptions

`http://www.icsa.net/services/consortia/anti-virus/virusdescriptions.shtml`

Virus Bulletin - magazine for antivirus professionals

`http://www.virusbtn.com/`

Computer Virus Myths

`http://kumite.com/myths/`

Hoax (Alert) Information

`http://www.icsa.net/services/consortia/anti-virus/alerthoax.shtml`

If you have questions about a particular virus, feel free to send email to *pcs-group@fnal.gov.* We are on many of the major security mailing lists and we can let you know if the information you have is valid.

9.4 File Sharing

Most of the time file sharing is done within a group, department, or project. An area for shared files may already be provided on your server, so check with the appropriate persons in your group.

9.4.1 Individual Users

As an individual who needs or wants to share particular files, we recommend that you first find out if a shared folder exists or can be created on your server (outside your personal area) to meet your needs. Contact your group's PC administrator or your local server administrator.

If you can't access a shared folder, your other option is to create a special folder in your personal area on the server, and apply the appropriate permissions to it, as well as to the files in it that you want to share. Be aware that you need to apply these permissions to your top-level personal folder as well, so that the authorized user(s) can access the share folder and files.

Setting permissions is described in the help files on NT. Select Help from the Start menu, and look under `files/permissions`, `folders/permissions`, and/or `folders, shared/permissions`. You can also contact the PCS group at *pcs-group@fnal.gov* for assistance, or refer to a text describing standard NT features and functionality.

9.4.2 Departments and Groups

PCS provides file storage areas for information needed on a department-wide or group-wide basis. The department/group leader is given full control over the contents of the provided area, and he or she is responsible for controlling access to it by members.

9.4.3 Projects

Projects sometimes span departments and groups, and may not include all members of them. Project areas are similar to department/group areas, but allow for this overlap. The project leader is given full control over the contents of the provided area, and he or she is responsible for controlling access to it by members.

10. Printing in the FNAL NT Domain

In this chapter we include NT-specific printing information, and refer you to existing documentation. Information on printing facilities at Fermilab is maintained in a series of Computing Division Web pages. For general printing information, select *Printing* from the Computing Division Home Page.

The information presented here is valid for Windows 95/98 in addition to NT.

10.1 Printer Queue Naming Conventions

The printer queues available on your NT server are generally named according to the printer's location and the printer type, however there is some variation. A few examples should illustrate the naming conventions used:

- FCC2E_HP5SI is located in the Feynman Computing Center (FCC), second floor, east side. It is an HP LaserJet 5SiMX.
- FCC3E_COLORPS is located at FCC, third floor, east side. It is a color PostScript Laser Printer.
- WH8X_HP5SI is an HP LaserJet 5SiMX located on the Wilson Hall (WH) eighth floor crossover (8X).

10.2 How to Configure Your Machine to Print

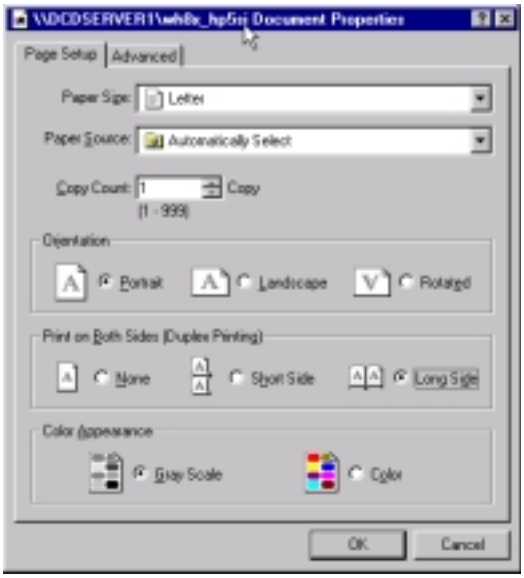
Your NT server should have some printer drivers installed (some or all of which may be maintained on the Fermilab print server FNPRT, described on-line at `http://www.fnal.gov/cd/main/printing.html`), and you can configure your client machine to print to one or more of them. To find a printer that is convenient for you, consult the directory listing under your NT server. For instructions on finding a printer and configuring your machine to print to it, consult the document *Printing on NT through the Network Neighborhood*. This document is available on-line at `http://www-pcs.fnal.gov/printing/nt-net/`.

To configure your workstation to print directly to a network printer, see *Adding a TCP/IP printer in NT4.0*. This document is available on-line at `http://www-pcs.fnal.gov/printing/nt-tcpip/`.

10.3 How to Print PostScript Files

From most applications that generate PostScript output, you can print directly from the application. To print PostScript files that have been created externally by applications unknown to NT or to which you don't have access, you can either use a specialized print utility or you can go to the command prompt and execute a print command.

We encourage you to use two-sided (duplex) printing whenever possible to save paper. Most of the PostScript printers on-site support this feature. Duplex printing is an option on the printing setup screen for most Windows applications, for example:



10.3.1 PrintFile Utility

The print utility **PrintFile** is available from `Pckits` (see section 7.2 *What Software is Available and Where Can You Find It?* or our Web page *Software Products for Windows NT* at `http://www.fnal.gov/cd/main/pcsoftware.html`). **PrintFile** can be used for plain text, EPS and binary formats in addition to PostScript.

10.3.2 DOS copy Command

If you have a local or remote printer attached to `lpt1:`, for example, the following command should work:

```
U:\your_ps_dir> copy /b filename.ps lpt1:
```

The use of this command and your printing configuration is discussed in the document *Printing PostScript from a Windows based PC*. It is available on the Web at `http://www-pcs.fnal.gov/printing/pc-ps-print/`.

10.4 How to Add and Configure a Printer

This topic is well documented in *Adding a TCP/IP printer in NT4.0*. This document is available on the Web at `http://www-pcs.fnal.gov/printing/nt-tcpip/`.

A. Dynamic Versus Static IP Addresses

Here we describe dynamic and static IP addresses, and discuss the advantages and disadvantages associated with each type.

Before connecting your machine to the network, please fill out the *Node Registration Form* on-line at `http://fncdug.fnal.gov/misnet-cgi/nwsvc.pl`, which allows you to select a DHCP (dynamic) or static IP address. This form also registers your hardware address with the Data Com and Networks group in the Computing Division.

A.1 Dynamic IP (DHCP) Address

Each time a DHCP client boots, it sends out a DHCP *discover* message. All DHCP servers answer (in practice only one is set to do this at Fermilab; in the future possibly a second will be added for redundancy) with an *offer* message that includes an address which is available to the client.

The client machine typically repeats the *discover* message several times to make sure it hears from all the servers, then eventually chooses the "best" server, where what is "best" is up to the client. It may mean that the addresses the DHCP server has available offer the longest lease time. Or the client might prefer a server that provides WINS servers over one that doesn't (the WINS servers keep track of all the clients' and servers' latest dynamic IP addresses).

The currently active DHCP server is configured by hand to handle and reserve IP addresses and the IP configuration information that goes with them. Addresses are made available in an order that permits a client to have the best chance of getting back the same address it was using most recently. To this end, the DHCP server offers its *least recently used* address to a new client.

Once the client chooses a DHCP server, it "officially" requests the IP address and configuration information. In addition to this, it receives a lease time for the address. This lease time is not absolute. As long as it is running, the client machine requests renewal of the lease. This is invisible to the user, although there is a mechanism for the user to release the address early (**`ipconfig/release`** from the command prompt).

Client machines in the NT domain typically access multiple file servers, print servers, and so on. The clients as well as the servers may change their IP addresses. Via the WINS servers, this is transparent to the user.

Advantages

1) All the IP configuration information gets automatically configured for your client machine by the DHCP server.

2) If you move your client machine to a different subnet, the client will send out its discover message at boot time and work as usual. However, when you *first* boot up there you will not be able to get back the IP address you had at your previous location regardless of how little time has passed.

Disadvantage

Your machine name does not change when you get a new IP address. The DNS (Domain Name System) name is associated with your IP address and therefore *does* change. This only presents a problem if other clients try to access your machine by its DNS name. One example is **ftp**. If a Windows machine is set up as an **ftp** server, then its **ftp** server name (which uses the DNS name) changes every time the IP address does. If you need to use your Windows machine as an **ftp** server (or as a Web server), request a static IP address rather than a dynamic one.

A.2 Static IP Address

If you have requested a static IP address on the *Node Registration Form*, you need to wait for the reply with all the information you need to use for configuring your machine. Once you receive it, under Windows, delve down to Start/Settings/Control Panel/Network/Protocols and enter the information that you received.

Advantages

1) The two names (Windows name and DNS name) are the same as each other, and neither ever changes. Other clients may therefore reliably access your machine by its DNS name (e.g., using **ftp**).

2) With a static address your machine is more easily accessible by non-Windows internet services. This is not a significant advantage as people seldom telnet to their Windows PC.

Disadvantages

1) You can't move your machine to a different subnet and expect it to work. You need to reconfigure it.

2) If machines come and go, or are up only some of the time, static assignments are less resource-efficient (where the resource in question is the IP address itself).

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